# A Study of the Psychological Foundations of Education： A Working Paper on Psychological Principles as Related to Learning

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## Abstract

This is a study of psychological principles as related to learning. Learning theory, motivation and quantitative methods will also be explored.

I will try to gain an understanding of how students learn and understand student behavior and motivation in order to be able to assess effective teaching, referring the book *Educational Psychology—Windows on Classrooms,* by Paul Eggen and Don Kauchak.

In section Ⅰ, focusing on Vygotsky's theory, applicability to my own educational experience is discussed, and in section Ⅱ, I present an idea about how to promote learner motivation. In section Ⅲ, the instructional components are explored. In section Ⅳ, Traditional Measurement Formats are compared with Alternative Measurement Formats.

**Key Words**：Learning, Motivation and Management, Instruction, Assessment

## 和文要旨

　小論では，Paul Eggen, Don Kauchak 共著の *Educational Psychology—Windows on Classrooms* を参考にし，学習理論，動機，教授法に触れながら学習者の心理を研究した。

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Section Iでは，Vygotsky の理論を中心に学習理論を考察し，Section IIでは，学習者の学習意欲をいかにして高めるか，Section IIIでは，教授法を，Section IVでは，評価の基準・方法について，それぞれ実際の教授体験を踏まえながら検討した。

# ［ I ］ The Student

## Vygotsky's theory

The concept of activity is central to Vygotsky's theory : "Children literally learn by doing—by becoming involved in meaningful activities with more knowledgeable people" (Eggen & Kauchak : 1997 : 53). This concept is accurate because unless learners can use knowledge in authentic situations, or, in other words, unless knowledge links with experience, their learning will not be meaningful. My teaching experience in teaching English as a second language proves this. If teachers provide opportunities to use English in authentic situations, learners develop remarkably. One good example of this is that the students who studied abroad can speak and read English well. I believe the best way to teach English as a second language is to immerse students in English-only programs in order to provide them with actual experience in using English as the means of communication.

In Japan, English is regarded as important. We teach English to students from junior high school to high school. Considering the fact that 95.9% of junior high school students graduate and go to high school, all of them have learned English for six years. Regrettably though, it is a fact that they can't use English practically. I think the main reason is that teachers don't focus on activity. Putting too much importance on grammar or vocabulary, teachers are just lecturing and explaining. Eventually such teaching leads students to lose their interest to learn, because for them, learning English becomes memorizing a lot of vocabularies and learning grammar, without broadening their knowledge or experience. We shouldn't forget that language serves a function in self-development ; by acquiring a second language, students can interact with other people and broaden their world through cultural exchange.

I find it true from my teaching experience that when students are immersed in English-only programs, they show remarkable progress and show an interest in learning. This is because they use language to experience "the cultural exchange of ideas"(Eggen & Kauchak : 1997 : 53). It is nothing but the result of learning by doing—"by becoming involved in meaningful activities with more knowledgeable people"(Eggen & Kauchak : 1997 : 53).

## Applying Vygotsky's theory in my classroom

"Vygotsky's theory of development emphasizes the importance of language in learning that occurs in activity-oriented, social situations. By using language, more knowledgeable partners share their expertise about the world"(Eggen & Kauchak : 1997 : 54). The concept led by his theory is "Zone of Proximal Development" that means "the level of proficiency beyond what a child can do alone and represents the range of tasks that can be accomplished when assisted by a competent adult or peer"(Eggen & Kauchak : 1997 : 54). Applying this zone of proximal development to teaching includes three tasks ; the first task is to assess, the second, to fit the learning tasks to the developmental levels of the students, and the third, to provide instructional support. The instructional strategies based on Vygotsky's theory are powerful ideas. In fact, I use some of them in my teaching.

For example, when I teach English Reading class, I provide scaffolding : I use scaffolding to help students progress through the zone of proximal development. I believe good reading is a skill that can be learned. It is something different from just knowing vocabulary and grammar. The most important thing is to catch the general meaning of what is read. Most of the problems in an English Reading class in Japan seem to come from everything in the same way ; in most of the reading classes teachers tend to read the articles slowly, word-by-word, without seeing the connection between parts. They put more importance on translation than understanding of the content. I believe we should get rid of such way of reading. So, I provide my students with printed materials which will help reading. I ask many questions about the content of an article in English. My students have to prepare to answer these questions in English before the class begins. In the classroom, I ask these questions to the students first and then make them sum up the article in English without doing any translation. I want them to think about what they've read.

Second, in order to guide interaction, I present several questions which will lead to a discussion. At the first level, I make them give their opinions in Japanese. At the second level, I ask them yes or no questions in English. At the third level, I ask them what, who, when and how questions. Finally, I want them to express their opinions in easy English. I'm sure this instructional strategy works well in my class. The students get rid of their "Japanese way of reading".

Even though teachers adopt effective strategies to teach, it will end in vain if students don't "perceive learning activities as substantive and worthwhile"(Eggen & Kauchak : 1997 : 87). For learners, learning becomes meaningful when they see their learning is useful or when they can use them in actual situations. It's important for students to speak English and to exchange their opinions with each other in English in the classroom. At this point,

I face a difficult problem ; in Japan, it is hard to make the students speak English or exchange their opinions in class. I want them to speak in English in my class, but most of the students hesitate to give their opinions in classes even in Japanese. They seldom ask questions even if they don't understand. They sit quietly and wait to be given instructions from teachers. In a sense, it's easy for teachers when they want to give them a lot of knowledge. This is one of the reasons why Japanese students get high scores on English paper tests but they can't use English in actual situations. There remains the question of whether such learning is meaningful or worthwhile for learners.

It is sure that education in Japan is gradually applying constructivist ideas in teaching. Considering students' interests so as to encourage them to further learning, each school is revising its curriculum so that it includes experience-learnings, or is trying to provide students opportunities to learn the basics in the specialities of their choice. On the other hand, it is true that there are still many adopting the conventional way of teaching. We should make more effort to provide "experience, guide discussion and assume a supportive role in the process of students' attempts at developing understanding"(Eggen & Kauchak : 1997 : 60) to make learners feel that learning is meaningful or worthwhile.

## ［Ⅱ］Learning

Cognitive theories "assume that learners are mentally active and construct their own understanding of the topics they study"(Eggen & Kauchak : 1997 : 282), and they "acknowledge the role of environmental influence but emphasize internal, mental processes in attempting to understand learning"(Eggen & Kauchak : 1997 : 282). In Cognitive learning theory, mental processes, such as reasoning, are regarded important and it focuses on a mental change in the learner ; "from a cognitive perspective, learning is a change in a person's mental structure that provides the capacity to demonstrate change in behavior" (Eggen & Kauchak : 1997 : 238).

On the other hand, constructivism puts more stress on learners constructing their own understanding than do other cognitive theories. They disagree on the nature of knowledge.

I agree with the constructivist view that "learners construct their own understanding, that new learning exists in the context of prior understanding, that learning is enhanced by social activity, and that authentic tasks promote learning"(Eggen & Kauchak : 1997 : 282). According to Eggen and Kauchak, characteristics of constructivism are as follows :

Learners construct their own understanding.

New learning depends on current understanding.

Learning is facilitated by social interaction.

Meaningful learning occurs within authentic leaning tasks.

(Eggen & Kauchak : 1997 : 275)

I think the main impact of the Constructivism Movement on Traditional Cognitive Educational Theory is its core idea that it "emphasizes that learners develop their own understanding that makes sense to them ; they don't receive understanding from an outside source" (Eggen & Kauchak : 1997 : 275).

When we see the characteristics of constructivism above, we find that these characteristics can be seen across the school curriculum in Japan. In fact, the influence of constructivism in teaching and learning is increasing. For example, we can find this trend in the Curriculum Council's Report of Monbusho (the Ministry of Education). They aim, as one of the purposes of the national curriculum standards reform, "to help a child develop the ability to learn and think independently". The report claims that "There was a tendency for school education to emphasize a large volume of knowledge. Now however, school education considers the children's standpoint and places a high value on the development of children's intellectual interest and inquiring minds. It also emphasizes the importance of motivating children to learn and helping them develop their abilities to learn, to reason, to judge, to express, to discover and to solve problems, and to create and cope with social changes independently. Besides, to aim at children's successful self-realization, it is indispensable to relate knowledge with actual life. This requires the promotion of the hands-on learning and problem-solving approaches"(monbu.go.jp/series-en/00000011/ : 1998 : 4). As we can see, like constructivism, they emphasize a child's ability to learn and think independently. They also recognize that authentic situations can increase children's motivation to learn. It is clear that this reformation is based on the idea of constructivism. Also, when we look at university education, we can find the same movement. Recently, in some universities, "internship"has been adopted and is counted as regular credits ; students work in companies which are assigned by their universities for a few weeks or do part time jobs which they choose. This idea is also based on constructivism : meaningful learning occurs within authentic learning tasks. In fact, we're moving towards a constructivism movement.

It is true that there has been a tendency for school education to emphasize a large volume of knowledge in Japan. Under this curriculum, the academic achievement of Japanese children is satisfactory overall. But, there are several problems existing : a considerable

number of children do not fully understand class contents, they lack the abilities to study and judge by themselves, and the ability to express their own opinions have not yet fully developed. I think this is because we put too much importance on conveying knowledge automatically without paying much consideration to the learner's mental process ; unless learners can relate their knowledge to reality or prior understanding, they can't understand at all. So a curriculum should be planned from the learners' standpoint and should put a high value on the development of the learner's intellectual interests and inquiring mind.

At this point, we should recognize that the ideas of constructivism such as information processing work well when a teacher can help learners be motivated and make study meaningful. It depends on a teacher's instructive ability, because it is a hard job for teachers to promote learner's independent learning and to further develop individualized instruction. The guidance role of teachers should be extremely sophisticated.

In constructivism, the practical and systematic instruction for teachers must be researched more.


## ［Ⅲ］ Motivation and Management

In this section, how to motivate learners is discussed.

As the teacher is an important factor in learners' motivation, he/she needs to make a conscious attempt to promote their motivation to learn. I would suggest that he/she try to motivate learners as follows :

The most important thing is to plan a learning-focused framework that emphasizes a task orientation and learners' progress to improve their ability. In order to plan a model, the teacher needs the followings characteristics : "modeling, enthusiasm, caring and positive expectation"(Eggen & Kauchak : 1997 : 366).

First, we must make leaners be interested in learning through modeling. You can start in the first class :

"I wish I could study with you. Though I'm a teacher, there are a lot of things I don't know. If there is something that I can't understand, please teach me. Also, if you don't understand the task we study, don't hesitate to ask me questions."

Second, when we communicate about attitudes and beliefs about learning, we must show enthusiasm. For example :

"When we face a difficult problem, let's think about it together and work on it together. I can consult many books or ask someone who is professional. I'm always ready to help you

study. Because I like to study with you all in my class."

Third, teacher expectations also influence learner motivation. But too much expectation is not effective. You should start with small expectations and gradually increase them. We can say :

"At first, you might possibly think your task is hard. But it isn't, if you challenge it. Suppose you can only do one problem today and will do the same the next day.  Think of what you will have done after a week. The first day, you've done only one, the second day, two, the third day, three... that shows you're improving. Don't be afraid of making mistakes. If you make a mistake, it means you can get a right answer. Because you know the right answer by making a mistake."

These three characteristics of teachers must be combined with classroom climate and instructional variables to enhance motivation.

Climate is very important because the best classroom climate encourages learners to be both motivated and to achieve learning. It should be "calm but not rigid."  We have to create an atmosphere as a place of trust, order, and cooperation for learning. In the first place, we must respect each other. You had better inform them at the beginning of the class how you respect and believe in them and want to treat each as a person. You can start : "We will always treat each other with respect and courtesy."

In order to create the best climate, we must make learners understand clearly the topic we study.  Once we can make them become interested in it, they will want to challenge it. Give them your expectation for their success at the same time. You have to encourage them that if they work hard, they will succeed in the end. Also, use a wide variety of high-quality examples and demonstrations to promote understanding.

The two factors discussed above, teacher characteristics and climate variables, promote learner motivation.

The third factor is instructional variables.

We need introductory focus. We can bring something that the learner will be interested in learning. When you begin the first class, you should clearly inform them of the topic they're going to study or why they're studying, and the goal that you desire. We need personalization ; we must make examples and give explanations which are all related with real life. For example, when we teach a sum in the rule of three in math class, you can start with the assumption that they travel abroad and buy some items. You can bring a real item which the class is interested in, such as basket ball shoes or something that children will be interested in. Choose something which we use in everyday life. Tell them the price in the original place, and make them compare it with the price in their country. When you

compare the price, children will find that it's an effective way to use the rule of calculation and they will know that they need to learn an equation. We also need involvement ; we must make them active in class. It's effective for you to sometimes ask questions of them. Or you can use a drill which they can do easily and answer like a game. You had better ask many questions starting with as easy ones as you possibly can, to attract their attention and to make them become involved in your class. Using open-ended questions is better. In that case, you have to remember each student's name as best as you can. If you can't remember all of them, make name card or seating chart. It's important for learners that the teacher remember his/her name immediately.

Finally, immediate and specific feedback is necessary. We must see that students understand actually. You can give them a little test, for example. Give them praise if they can do well. One way of encouraging them is to give them some stamps for good achievement which they can collect.

As I've shown, teachers characteristics, climate variables and instructional variables are important factors in promoting learners' motivation. I believe the most effective way is to try to make the learners like you or be interested in you. If a learner likes or is interested in a teacher, he/she will like or be interested in learning. As a result, his/her motivation will increase.

## ［Ⅳ］Instruction

The curriculum is one of the most important factors for teaching. The curriculum I feel best for effective teaching is planned according to three topics : how to design the best instructional plan, how to acquire teaching skill, and how to choose the best instructional methods, such as lectures, including activities, discussions, and training.

First of all, teachers must know pedagogical content knowledge such as guiding or scaffolding. Unless teachers have enough knowledge of learners and learning, they can't be effective. Secondly, teachers won't be effective simply because they have a lot of knowledge of education. They have to "teach". They have to know how the educational theories or instructional strategies they use work in real classes and find the best instructional way.

### How to design the best instructional plan

Careful planning is very important in instruction. Because it makes teachers clear about the goals at which they aim. To design an effective scheme, teachers must choose the best

instructional scheme that is appropriate for learners or subjects.

First, two approaches to effective instruction must be considered : the Teacher-Centered Approach to Instruction and Learner-Centered Planning. Second, study some models of each approach that work well. Third, make a plan for their own instructional method by using both approaches ; check whether goals are clear, objects are flexible, tasks are authentic and representations are varied, group work is included, a good learning classroom climate is planned, and an efficient assessment is decided or not. Using the plans, various cases should be assumed, such as cases of teaching to children or adults, or cases of teaching in a language class or science class. Finally, an actual instruction in a classroom according to each plan is to be made. Feedback is necessary as to whether each plan is practical or not.

They should find that a learner-centered approach often works better than a teacher-centered approach, because it can motivate learners more because emphasis is placed on helping learners construct their own understanding. But they must also find that adopting only one approach isn't always best and there are some cases when both approaches must be adopted flexibly. It is necessary for teachers to take into consideration the learners' backgrounds and behavioral patterns as well as the characteristics of the subjects they teach.

### How to acquire teaching skill

Teaching skill is necessary to be an effective teacher. Four skills are necessary including attitude ; 1) positive attitude, 2) skill in organizing time, 3) skill to communicating a goal or a task, and 4) sophisticated skill or imaginative ideas for attracting learners to learning activities.

As we have seen in the previous session, teachers must have certain characteristics : "modeling, enthusiasm, caring and positive expectation". That is, first, teachers must always be positive toward teaching. Second, they should not hesitate to spend much time with their work. This doesn't mean simply taking time but means to organize their time and use time effectively. Third, teachers must communicate goals or tasks precisely and clearly, using accurate terms, making clear relationships, and using emphasis. Fourth, teachers should invent some strategy to attract learners' attention to focus. They must know how far a learner can understand and check the process of learning at the same time. Questioning is one of the important teaching skills in this procedure.

In fact, these skills are not easily acquired. Whether being able to acquire them or not depends on each teacher's effort and enthusiasm for teaching. Teachers must always seek

out ways they can instruct effectively, or promote learner's motivation. There is no effective way to transfer these skills except by teaching service. As these skills are acquired, for the most part, by experience, providing new teachers with teaching experience in a real class is also important.

### How to instruct

Teachers decide the way in which they will instruct. There are two approaches to instruction : the teacher-centered and the learner-centered approach. It's important to understand both effective cases and ineffective cases in each approach.

In the Teacher-Centered Approach such as Direct Instruction, teachers need procedural skills such as using a variety of representation clearly and developing them by practice. When teachers can't use direct instruction, they may use the lecture style in which it is easy to input knowledge and present multiple examples.

On the other hand, in the Learner-Centered Approach, the central role is placed on the learners. This strategy includes the discovering approach, guided discovery, discussion, student group work, cooperative learning and individual instruction.

The teachers should find that Learner-Centered Approach is better, because from a motivational point of view, it encourages learners to be interested in learning and makes them able to think by themselves. On the other hand, in the Teacher-Centered Approach, it is rather difficult to involve learners because they may become passive about learning. But in cases such as teaching literature, the latter approach seems effective.

### Final goal

The teachers must understand the following points :

1. Teachers need to keep in mind that all approaches to instruction are intended to help students reach goals ; a Learner-Centered Approach is often more effective than Teacher-Centered Approach, because it helps students acquire a deep understanding of the content or the goal.

2. There is more than one method of effective instruction. Teachers must be clear about their goals and design learning activities to reach them. It is important to try several methods or strategies to find the most effective means of instruction.

3. No strategy is practical unless teachers use it effectively, and each one depends on the skill or ability of the teacher practicing it. Nothing substitutes for teaching experience in acquiring such teaching skill.

They must try various experimental ways of teaching and find which is best for his/her

own instruction, because methods or strategies to adopt depend on the characteristics of subjects, and even the teacher's personality. The best way to find an effective method of instruction is for a teacher is to pile on experiences.

### To improve current teaching

First, in order to improve current teaching and the general curriculum, teachers must adopt authentic tasks as much as they possibly can. To introduce outside capable individuals or talented members of society to the school is one of the best ways. More part-time lecturers who are in-service should teach in the class. Giving learners lively lectures would produce a considerably good result.

Second, to promote the study programs such as establishing a long-term practical training program should be necessary. Third, in this info-oriented society, teachers need to undergo a training program in computer technology.

Fourth, in order to accord with an internationalized society, it is important to give teachers the opportunity to acquire international experience, together with mutual understanding of language and culture. The program of teacher exchange must be promoted.

### [V] Assessment

### Comparison between Traditional Measurement and Alternative measurement

Traditional Measurement

In traditional Measurement, there are nine kinds of formats as P. Eggen and D. Kauchak show in their book : "True-false, Multiple choice, Matching, Fill in the blank, Short, open-ended answer, Paragraph response to specific question, Paragraph response to open-ended question, and Essay"(Eggen & Kauchak : 1997 : 519). Now dividing them into two groups, we can see the characteristics of each format easily ; [Group Ⅰ], the objective formats such as True-false, Multiple choice, Matching, Fill in the blank, and [Group Ⅱ], the subjective formats such as Short, open-ended answer, Paragraph response to specific questions, Paragraph response to open-ended questions and Essays.

The advantages and disadvantages of each group are as follows :

[Group Ⅰ]

ADVANTAGES

・able to provide valid assessment of many aspects of student progress

・easy to find the students who don't understand the content

・giving them the best answer as a correct one promotes higher level thinking as in Multiple-choice format

・easy to get results because it can be scored

DISADVANTAGES

・unless well-constructed, students possibly answer without fully understanding content

・able to measure only simple knowledge-level outcomes

・unreliable because of guessing factors such as in Fill in the Blank

・unable to measure student ability to use the knowledge in authentic situations


[Group II]

ADVANTAGES

・able to measure the ability to organize ideas, to make and defend an argument, and to express ideas

・able to integrate to higher order and critical thinking

DISADVANTAGES

・scoring is very time-consuming

・scoring is highly subjective and notoriously unreliable

・scoring is strongly influenced by writing skill, and grammar or spelling errors

・handwriting tends to artificially influence scores

・unable to measure student ability to use the knowledge in authentic situations


Thus, Traditional Measurement has some advantages and disadvantages. As in group I, unless teachers make a well constructed test, the assessment tends to be unreliable in the point of whether students can understand the content or not. Teachers need to spend much time to make valid tests. On the other hand, if the format is efficiently constructed, the assessment will be reasonable. In group II, how to plan grading criteria greatly influences assessment. The important task for teachers is to establish clear grading criteria before scoring. Unless grading criteria is made clear, the assessment will be unreliable. The most lacking element in Traditional Measurement is that we cannot measure student ability to use the knowledge in real life.

Authentic Assessment can make up for this lacking.


**Authentic Assessment**

In Authentic Assessment, teachers must directly measure student performance through

"real life" tasks. The advantages and disadvantages of Authentic Assessment are as follows :

ADVANTAGES

・able to tap higher level thinking and problem-solving skills

・able to invoke real-world applications

・able to ask students to perform, create, produce, or do something

・able to provide opportunities for students to reflect on their own learning progress in Portfolio

DISADVANTAGES

・difficult to perform : teachers must put students in as lifelike an assessment situation as possible and evaluate student performance against realistic criteria as in Performance Assessments

・difficult to decide what goes into and on what criteria the students' works will be evaluated as in Portfolio

・very time consuming to evaluate

・need solid evaluation methods such as systematic observations and checklists

In the above, we examined the advantages and disadvantages of both traditional and alternative assessment. In both types of assessment, we must never forget that the final goal is to increase learning and motivation. In the process of measuring, teachers must use effectively a range of measurement tools to gain different aspects of student learning. By using a traditional format or an alternative format, knowledge, comprehension, and higher order thinking and problem-solving ability can be measured. In the process of evaluation, teachers must make decisions on when to assess, and what form the assessment will take. And especially, deciding criteria of the assessment is a very important task for teachers. Also, when designing assessment, individual items must be combined into tests, performance assessment. Assessment must be administered, scored and discussed to maximize learning.

### The development and improvement of assessment techniques for the future

Improvement of evaluation methods is expected to contribute to the development of student ability to learn and to think, to judge and to express. Teachers must employ different assessment techniques suitable to each stage of schooling, each grade, and the unique characteristics of each subject.

Designing a grading system is another important task. The format of this system will

influence both student learning and teacher workloads.

In Japan, we are moving from traditional assessment toward alternative assessment. In fact, the format of the grading system in elementary school has changed completely. 15 years ago, the report card reported a grade score, from 5, the highest, to 1, the lowest, by the form of formative evaluation. But today, it is reported by the record of learning. (See Sample 1 and 2 in the Appendix.) I think it's a good idea for reducing the competition among children. But the current grade card is a little obscure when it comes to motivate children. I believe we need to grade or give scores in some degree. In this point, I support the idea of a "table of specifications"(See Table 1 in the Appendix), because we can see clearly the goal and the outcome. Although the new system of grading is becoming better compared to the format of the past report cards, it seems to me we need to improve and create more effective assessment practices.

As we have seen, assessment is a very complicated and difficult problem together with other educational problems. I think the most important thing in assessment is to find the best plan or design suitable to each stage of schooling, each grade, and the uniqueness of each subject. More effort and study on the part of the teacher will be expected and necessary.

## References

Paul Eggen & Don Kauchak, 1997, *Educational Psychology－Windows on Classroom*. Simon and Schuster.

ed. Saburo Sato, 1979, *The theory of Bruner*. Meiji-shoin Publishers.

Monbusho, 1996, *White Paper*. the Ministry of Finance Publishing Department, the Ministry of Education.

Monbusho. *Educational reform moving forward*. http : //www.monbu.go.jp./series-en/00000011/

## Appendix

### SAMPLE 1

Sample report card in grade 5 in elementary school, in 1980s

| Subject | Outcome |
|---|---|
| *Japanese* | 5 |
| Social Study | 3 |
| Mathematics | 4 |
| Science | 5 |
| Music | 4 |
| Arts | 4 |
| Physical Training | 3 |

### SAMPLE 2

The current report card in grade 5 in elementary school

| Subject | | Outcome | | |
|---|---|---|---|---|
| | | Very good | Good | Needs to improve |
| *Japanese* | To have interest in Japanese | ○ | | |
| | To try willingly to think out the expression and think though reading | | ○ | |
| | To speak and write well | ○ | | |
| | To get the point of speech | | | ○ |
| | To understand the subject | ○ | | |
| | To understand the fundamental items of Japanese | | ○ | |
| | To write character neatly and collectedly | | ○ | |

### Table 1

Sample table of specifications

| | | Outcomes | |
|---|---|---|---|
| | Content | Knowledge Comprehension | Higher-Order Thinking and Problem-Solving |
| Cities | 4 | 2 | 2 |
| Climate | 4 | 2 | 2 |
| Economy | 2 | 2 | 2 |
| Physical features | 4 | 9 | 7 |
| Total items | 14 | 15 | 13 |